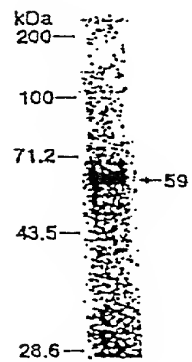


FIGURE 2



Downloaded from www.sagepub.com at [unintelligible]

FIGURE 3

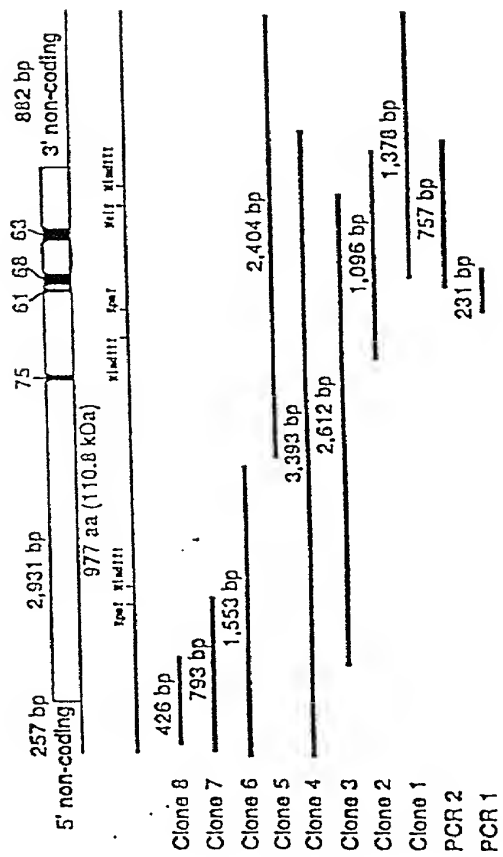


FIGURE 4

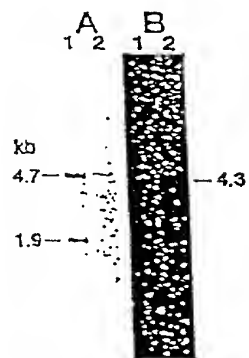
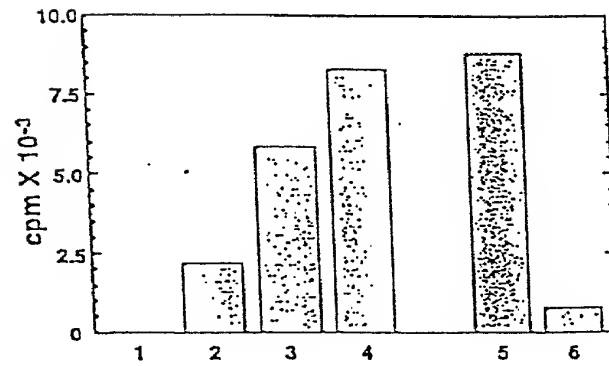


FIGURE 5

bPARG	(422)	ED KRKEQCEMKHQ RTE . . RKIPKYIPPH	SEQ	ID NO:	19
hPARG	(421)	ED RRKEQWETKHQ RTE . . RKIPKYVPPH	SEQ	ID NO:	20
mPARG	(413)	ED RRKEQCEVRHQ RTE . . RKIPKYIPPN	SEQ	ID NO:	21
CePARG	(29)	HQVPTMKRRKLTEHGNTTESLLLKEDPEEPKS	SEQ	ID NO:	22
hPARG	(205)	EG KRKGD . EVDG . VDEVAKKSKKEKDK	SEQ	ID NO:	23
mPARG	(205)	EG KRKGD . EVDG . TDEVAKKSKSRKETDK	SEQ	ID NO:	24
bPARG	(208)	EG KRKGD . EVDG . IDEVTKKSKSKKEKDK	SEQ	ID NO:	25
aPARG	(205)	EG KRKGE . EVDG . NVVAKKSKSRKEKEK	SEQ	ID NO:	26
XIPARP	(204)	EG KRKAD . EVDG . HSAATKKKIKKEKEK	SEQ	ID NO:	27
DmPARG	(202)	EELPDTKRAKM . ELSDTNEEGEKKQR	SEQ	ID NO:	28
SpPARG	(205)	EGVSSAKKAKI . EKIDEEDAASIKELTEKIKK	SEQ	ID NO:	29

FIGURE 6



CONFIDENTIAL

FIGURE 7

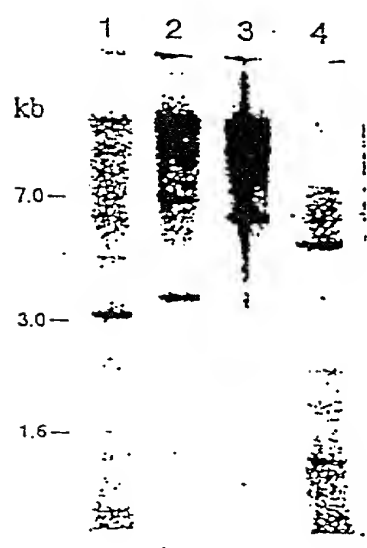


FIGURE 8



FIGURE 9

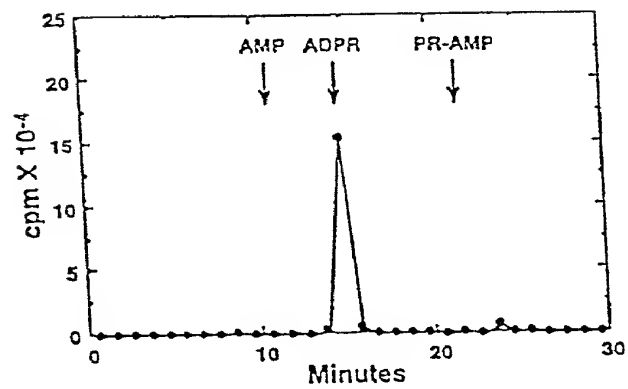
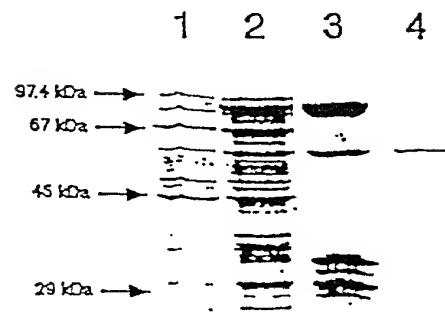


FIGURE 10



1. *Chlorophyll a* (Chl *a*)
 2. *Chlorophyll b* (Chl *b*)
 3. *Chlorophyll c* (Chl *c*)
 4. *Chlorophyll d* (Chl *d*)
 5. *Chlorophyll e* (Chl *e*)
 6. *Chlorophyll f* (Chl *f*)
 7. *Chlorophyll g* (Chl *g*)
 8. *Chlorophyll h* (Chl *h*)
 9. *Chlorophyll i* (Chl *i*)
 10. *Chlorophyll j* (Chl *j*)
 11. *Chlorophyll k* (Chl *k*)
 12. *Chlorophyll l* (Chl *l*)
 13. *Chlorophyll m* (Chl *m*)
 14. *Chlorophyll n* (Chl *n*)
 15. *Chlorophyll o* (Chl *o*)
 16. *Chlorophyll p* (Chl *p*)
 17. *Chlorophyll q* (Chl *q*)
 18. *Chlorophyll r* (Chl *r*)
 19. *Chlorophyll s* (Chl *s*)
 20. *Chlorophyll t* (Chl *t*)
 21. *Chlorophyll u* (Chl *u*)
 22. *Chlorophyll v* (Chl *v*)
 23. *Chlorophyll w* (Chl *w*)
 24. *Chlorophyll x* (Chl *x*)
 25. *Chlorophyll y* (Chl *y*)
 26. *Chlorophyll z* (Chl *z*)
 27. *Chlorophyll aa* (Chl *aa*)
 28. *Chlorophyll ab* (Chl *ab*)
 29. *Chlorophyll ac* (Chl *ac*)
 30. *Chlorophyll ad* (Chl *ad*)
 31. *Chlorophyll ae* (Chl *ae*)
 32. *Chlorophyll af* (Chl *af*)
 33. *Chlorophyll ag* (Chl *ag*)
 34. *Chlorophyll ah* (Chl *ah*)
 35. *Chlorophyll ai* (Chl *ai*)
 36. *Chlorophyll aj* (Chl *aj*)
 37. *Chlorophyll ak* (Chl *ak*)
 38. *Chlorophyll al* (Chl *al*)
 39. *Chlorophyll am* (Chl *am*)
 40. *Chlorophyll an* (Chl *an*)
 41. *Chlorophyll ao* (Chl *ao*)
 42. *Chlorophyll ap* (Chl *ap*)
 43. *Chlorophyll aq* (Chl *aq*)
 44. *Chlorophyll ar* (Chl *ar*)
 45. *Chlorophyll as* (Chl *as*)
 46. *Chlorophyll at* (Chl *at*)
 47. *Chlorophyll au* (Chl *au*)
 48. *Chlorophyll av* (Chl *av*)
 49. *Chlorophyll aw* (Chl *aw*)
 50. *Chlorophyll ax* (Chl *ax*)
 51. *Chlorophyll ay* (Chl *ay*)
 52. *Chlorophyll az* (Chl *az*)
 53. *Chlorophyll aza* (Chl *aza*)
 54. *Chlorophyll abz* (Chl *abz*)
 55. *Chlorophyll acz* (Chl *acz*)
 56. *Chlorophyll adz* (Chl *adz*)
 57. *Chlorophyll aez* (Chl *aez*)
 58. *Chlorophyll afz* (Chl *afz*)
 59. *Chlorophyll agz* (Chl *agz*)
 60. *Chlorophyll ahz* (Chl *ahz*)
 61. *Chlorophyll aiz* (Chl *aiz*)
 62. *Chlorophyll ajz* (Chl *ajz*)
 63. *Chlorophyll akz* (Chl *akz*)
 64. *Chlorophyll alz* (Chl *alz*)
 65. *Chlorophyll amz* (Chl *amz*)
 66. *Chlorophyll anz* (Chl *anz*)
 67. *Chlorophyll aoz* (Chl *aoz*)
 68. *Chlorophyll apz* (Chl *apz*)
 69. *Chlorophyll aqz* (Chl *aqz*)
 70. *Chlorophyll arz* (Chl *arz*)
 71. *Chlorophyll asz* (Chl *asz*)
 72. *Chlorophyll atz* (Chl *atz*)
 73. *Chlorophyll auz* (Chl *auz*)
 74. *Chlorophyll avz* (Chl *avz*)
 75. *Chlorophyll awz* (Chl *awz*)
 76. *Chlorophyll axz* (Chl *axz*)
 77. *Chlorophyll ayz* (Chl *ayz*)
 78. *Chlorophyll ayz* (Chl *ayz*)
 79. *Chlorophyll azz* (Chl *azz*)
 80. *Chlorophyll azaa* (Chl *aza*)
 81. *Chlorophyll abz* (Chl *abz*)
 82. *Chlorophyll acz* (Chl *acz*)
 83. *Chlorophyll adz* (Chl *adz*)
 84. *Chlorophyll aez* (Chl *aez*)
 85. *Chlorophyll afz* (Chl *afz*)
 86. *Chlorophyll agz* (Chl *agz*)
 87. *Chlorophyll ahz* (Chl *ahz*)
 88. *Chlorophyll aiz* (Chl *aiz*)
 89. *Chlorophyll ajz* (Chl *ajz*)
 90. *Chlorophyll akz* (Chl *akz*)
 91. *Chlorophyll alz* (Chl *alz*)
 92. *Chlorophyll amz* (Chl *amz*)
 93. *Chlorophyll anz* (Chl *anz*)
 94. *Chlorophyll aoz* (Chl *aoz*)
 95. *Chlorophyll apz* (Chl *apz*)
 96. *Chlorophyll aqz* (Chl *aqz*)
 97. *Chlorophyll arz* (Chl *arz*)
 98. *Chlorophyll asz* (Chl *asz*)
 99. *Chlorophyll atz* (Chl *atz*)
 100. *Chlorophyll auz* (Chl *auz*)
 101. *Chlorophyll avz* (Chl *avz*)
 102. *Chlorophyll awz* (Chl *awz*)
 103. *Chlorophyll axz* (Chl *axz*)
 104. *Chlorophyll ayz* (Chl *ayz*)
 105. *Chlorophyll ayz* (Chl *ayz*)
 106. *Chlorophyll ayz* (Chl *ayz*)
 107. *Chlorophyll ayz* (Chl *ayz*)
 108. *Chlorophyll ayz* (Chl *ayz*)
 109. *Chlorophyll ayz* (Chl *ayz*)
 110. *Chlorophyll ayz* (Chl *ayz*)
 111. *Chlorophyll ayz* (Chl *ayz*)
 112. *Chlorophyll ayz* (Chl *ayz*)
 113. *Chlorophyll ayz* (Chl *ayz*)
 114. *Chlorophyll ayz* (Chl *ayz*)
 115. *Chlorophyll ayz* (Chl *ayz*)
 116. *Chlorophyll ayz* (Chl *ayz*)
 117. *Chlorophyll ayz* (Chl *ayz*)
 118. *Chlorophyll ayz* (Chl *ayz*)
 119. *Chlorophyll ayz* (Chl *ayz*)
 120. *Chlorophyll ayz* (Chl *ayz*)
 121. *Chlorophyll ayz* (Chl *ayz*)
 122. *Chlorophyll ayz* (Chl *ayz*)
 123. *Chlorophyll ayz* (Chl *ayz*)
 124. *Chlorophyll ayz* (Chl *ayz*)
 125. *Chlorophyll ayz* (Chl *ayz*)
 126. *Chlorophyll ayz* (Chl *ayz*)
 127. *Chlorophyll ayz* (Chl *ayz*)
 128. *Chlorophyll ayz* (Chl *ayz*)
 129. *Chlorophyll ayz* (Chl *ayz*)
 130. *Chlorophyll ayz* (Chl *ayz*)
 131. *Chlorophyll ayz* (Chl *ayz*)
 132. *Chlorophyll ayz* (Chl *ayz*

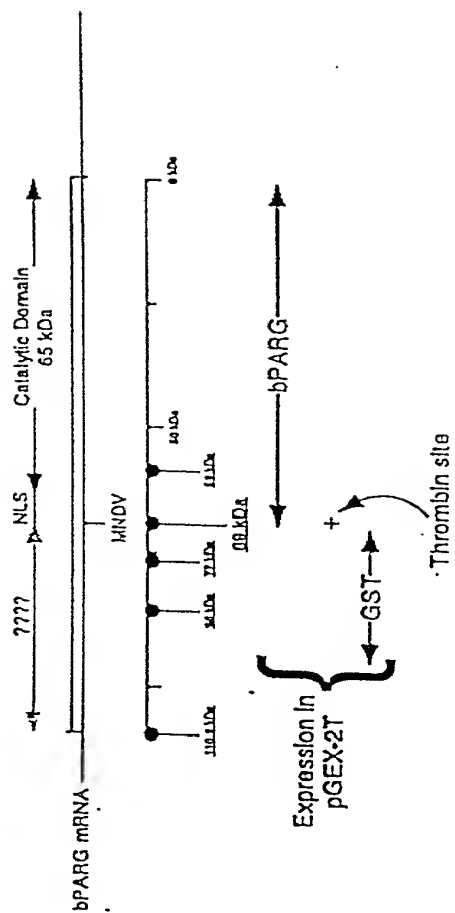


FIGURE 12

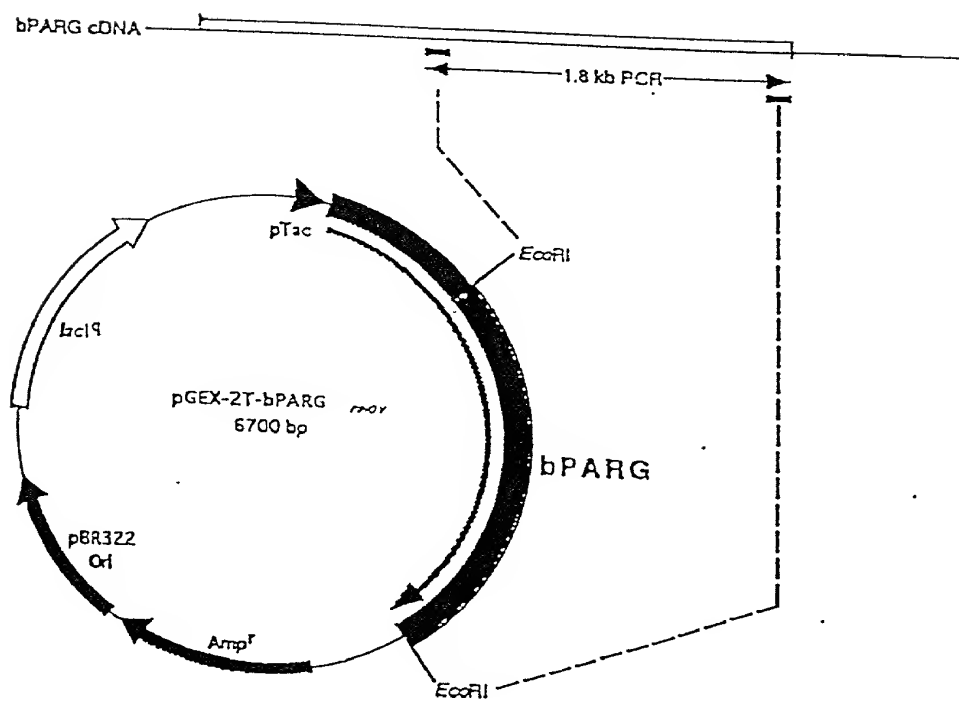


FIGURE 13

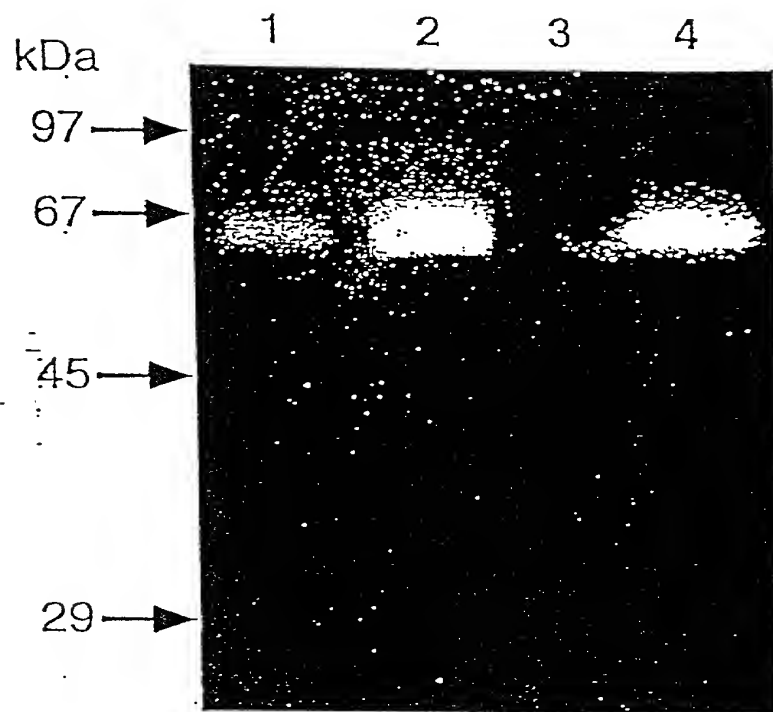
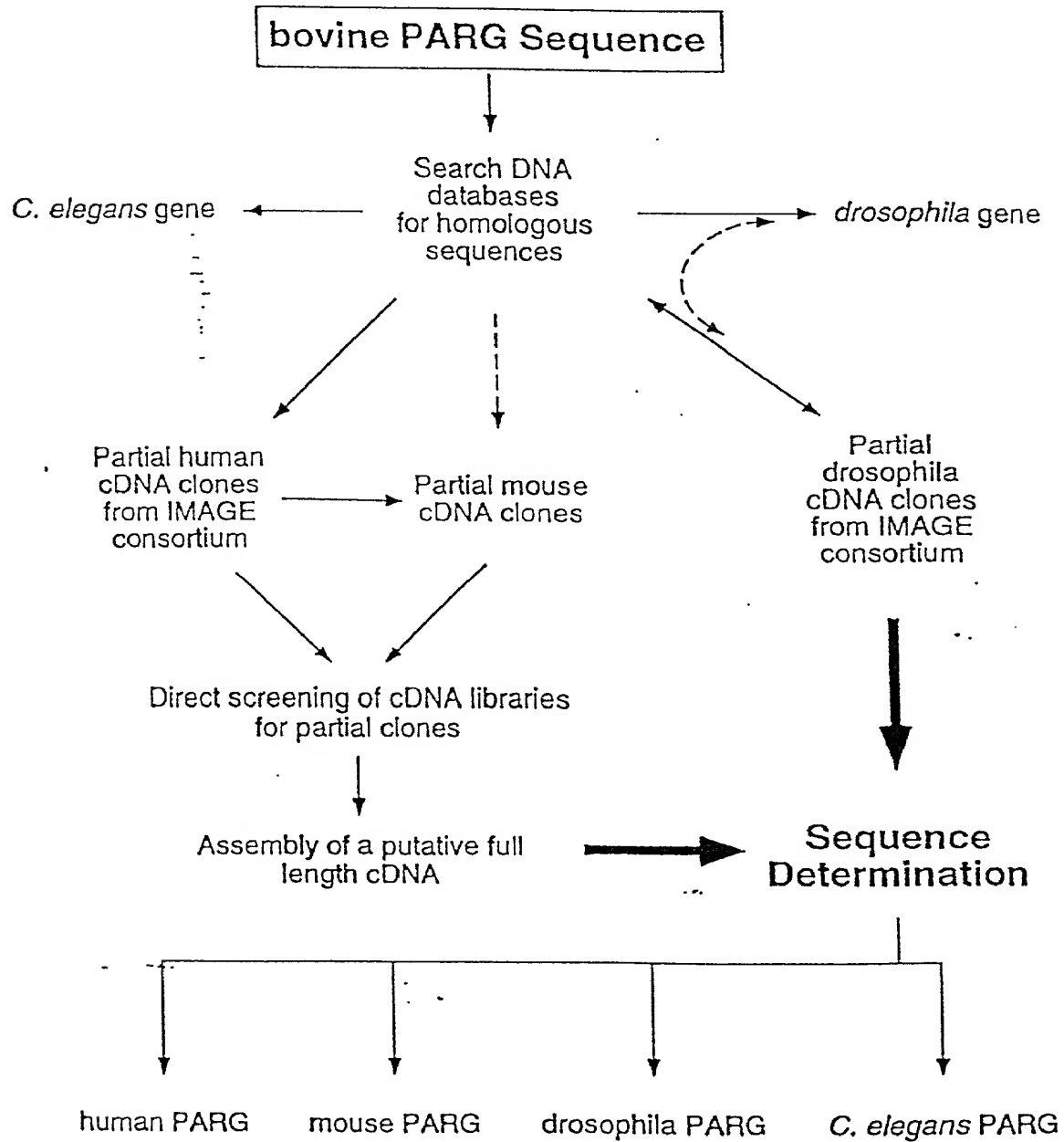
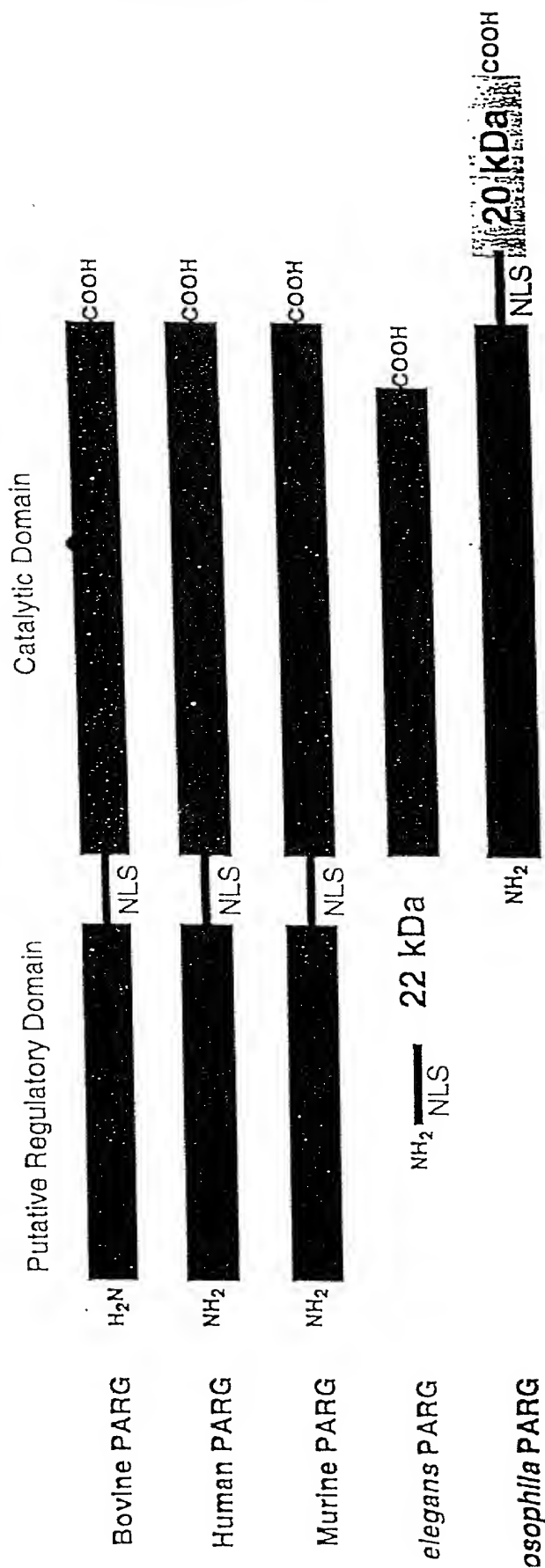


FIGURE 14

Strategy to Obtain Homologous PARG Sequences



Domain Organization of PARs



Multiple Alignment of Amino Acid Sequences of PARG from Different Species

```

parg      1 MSAGPGCEPCTRRPRWDAAATSPFAASDARSFPGRRRVLDSDRAFPVQFRVPFPSSSGCALGRAGQERGSATSLVFKQRTITSMWMDTRGKITVESSELSBK
parg      1 MNAGPGCEPCTKATRWGAATTS. PAASDARSFPPSRQRRVLDPRDAHVQFRVPFPSSPACVPGQAGQERGSATSLVFRQXTITSMWMDTRGIRTAESSELSBK
parg      1 MSAGPGHEFCTKA. RWGAAGTSAPTASDSRSFPGRRRVLDPKDAFPVQFRVPFPSSPACVSGRAGPERGNATSPVFKQRTITTMWMDTRGPRTAESSE...SR
parg      1 -----
eparg     1 -----

parg      101 ENNNTREESSMSSSVQKDNFYIQHNMEKLEHVSQLGFDKSPVEKGTQYLKQEQTAAAMCKWQNEGPHERLLESEFPVAVTLVPEQFSNANVDQSSPKDDHSDT
parg      100 ENNNTREISSMSSSVQKDNFYIQHNVEKLVHVSQLSLDRSLTEKSTQILNQEQTAAMCRWQNEGKETEQLLESEFPQTVTTLVPEQFSNANIDRSPQMDHSDT
parg      97 ENNNTRIDSMSSSVQKDNFYIPEXVEKLEHVPQLNLDKSPTEKSSQXLNQQQQTASVCKWQNEGREAEQLLASEFPFAGTFLPRLQLSNANIGQSPDTDDHSDT
parg      1 -----
eparg     1 -----MSKKFIELGDFVTQDEKDI8DY

parg      201 NSEESRDNQOFLTEVKL...ANAKQTMEDEQGREARSHQRCGKACHPAEACAGCQOEBTDVVSSEPLSDTGSESDVGTGLKNANRLNRQESSLGNSPPFER
parg      200 DSEENRDNQOFLTTVKL...ANAKQTTEDEHAREAKSEQKCSKEPGEEDCASCQOEDIDVVPSPSLSDVGSESDVGTGSKNDNKLIRQESSCLQNSPPFER
parg      197 DEEDRDNQOFLTFIKL...ANTKPTVGDGQ...ARSNCKCSGSRQSVKDCDTCGQOEEVDVLPESPLSDVGAEIDGTGPKNDNKLITGQESSLGDSPPFER
parg      1 -----
eparg     23 VGVGFABHQVPTMKRRKLTBEGNTTESREDPEEPKSRDVFVSSQSSDESQESDAENPEIAKEVSENCENLTETLKISNIESLDNVTERSEETLDN...EK

parg      298 ESEFESPMDVDNSKNSCQDSEADEETSPGFDE.QEDSSSAQTANKPSPRFQPREADTELKRSSAKGGEIRLHFQFEGGESRAGMN.DVNARRPFGSTSSLN
parg      297 ESEFESPMDVDNSKNSCQDSEADEETSPGFDE.QEDSSSAQTANRPSRFQARADIEFRIRYSTRGGVRLPEFQEGGESRTGMN.DLHAKLPQNISSLN
parg      291 ESEFESPMDVDNSKNSCQDSEADEETSPGFDE.QEDRSS.QTANRLSSCQAREADGDLRKRYLTGSEVRLEFQPE.GENNAGTS.DLNAKPFGSNSSSLN
parg      1 -----
eparg     119 STEFMEE.DVNNRSNIDVAINSDEDDDELVLLENKXEMRDGQVQQLS..QDLFADDQELIEYPGIMKDDTTQLDITDSSEVTAQKHEMIEETADSTFVG

parg      396 VECRNSKQEGRKDSRITDHFMRVPKAEADKRKEQCENKEQRTERRIPKXIIPFELSPDKEWLGTPIEM...RRMPCRGIRLPLRPSANETVTRVDDLRI
parg      395 VECRNSKQEGRKDSKITDHLMLPKAEDRRKEQWETKEQRTERRIPKXIIPFELSPDKEWLGTPIEM...RRMPCRGIRLPLRPSANETVTRVDDLRI
parg      387 VECRSSKQEGRKDSKITDHFMRISXEDRRKEQCEVHQRTERRIPKXIIPFELSPDKEWLGTPIEM...RRMPCRGIRLPLRPSANETVTRVDDLRI
parg      32 ....TNRLGR...ALCLNCARMKSPDGGTSEIE.....TEEE.PENLANSL..DSDWRGVSMEAIERNRQPELENLFPVTAGNLERVMYQLPIRET.
eparg     216 EDSKATKTVRTSSSSF...LSTVSTCEAPAKGRARMTQRELEREVIATTEGNLT...LQPDNLNWDPPDNRYR.CTIPNFPAEQG...RLRED.NRYG

parg      494 EVPR.FPPTTEPRDLWDNKEVKMPCSEQNLYPVEDENGE.RTAGSRWELIQTALLNRLTRFPQNLKDAILKNVAYSRRWDFTALIDFWDRVLEEAQAELY
parg      493 EVPR.FPPTTEPRDLWDNKEVKMPCSEQNLYPVEDENGE.RTAGSRWELIQTALLNRLTRFPQNLKDAILKNVAYSRRWDFTALIDFWDRVLEEAQAELY
parg      485 EVPR.FPPTTEPRDLWDNKEVKMPCSEQNLYPVEDENGE.RTAGSRWELIQTALLNRLTRFPQNLKDAILKNVAYSRRWDFTALIDFWDRVLEEAQAELY
parg      115 .FPR.PYSPFGK..WDSEVRLPCAPESRIYFRENPDGS.TTIDFRWEMIERALLQPIKTCBELQAAIYSINTTIDQWHFRALHQLLDEBLDESETRVFF
eparg     303 ..PKXIVLPQWRRE.PDSRGR...RDSIFYPRRKLDGYLKCYKTGTGYPFVGLE.....NMWE..PDPDITR...LPAL..EMYIKEMSELVOREV

parg      592 QSILPDMVKIALCLPNICTQPIPLLKQKMNESITMSQEQIASLLANAFPTCTFFPRNA.RMRSEYSSYPDINFNRLFEGRSSRRPEKLTLPFCYFRRV..T
parg      591 QSILPDMVKIALCLPNICTQPIPLLKQKMNESITMSQEQIASLLANAFPTCTFFPRNA.KMKSEYSSYPDINFNRLFEGRSSRRPEKLTLPFCYFRRV..T
parg      583 QSILPDMVKIALCLPNICTQPIPLLKQKMNESITMSQEQIASLLANAFPTCTFFPRNA.KMKSEYSSYPDINFNRLFEGRSSRRPEKLTLPFCYFRRV..T
parg      210 EDLLPRIIRIALRLPDLIQSPVPLLKHEKNASLSLSQOISCLLANAPLCTFPRNTLRKSEYSTFPDINFNRLYQSTGPAVLERLKCIMHYFRVCTP
eparg     384 LEKPARVARIAKTAEDILPERIYRLVGDE.BATLSEKQCAALVARMFFA.....RPDSPFS.....FCRLSSSDRSICVERLKLFTPTP.....

parg      689 EKK...PTGLVTFTRQS.L.ED.F.PEWERCHELL..TRLHVTEGTEHGNQGMLQVDFANRFVGGGVTSAGLVQEEIRFLINPELIVSRLFTVELDH
parg      688 EKK...PTGLVTFTRQS.L.ED.F.PEWERCHELL..TRLHVTEGTEHGNQGMLQVDFANRFVGGGVTSAGLVQEEIRFLINPELIVSRLFTVELDH
parg      680 EKK...PTGLVTFTRQS.L.ED.F.PEWERCHELL..TRLHVTEGTEHGNQGMLQVDFANRFVGGGVTSAGLVQEEIRFLINPELIVSRLFTVELDH
parg      310 ERDASNVTGVTGVTVFRSSGLPEH.L.IDWSQASAPLGDVPLHVDABEGTIDEGIGLLQVDFANKYLGCGVLGHGCVQEEIRFVICPELLVXGLFTTECLRP
eparg     463 DKMSMDPDDGAVSF.RLTRMDRDTFNEEM.KDARLRSLFEVEFDEMLIEDTAL.CTQVDFANBEELGVLNHEGVSQEEIRFLMCFBMMHVGMLLCEKMKQ

parg      779 NECLITGTGEQYSEITGYAETIRWA.....RSEEDRSE.RDDWQRRTTEIVDAIDALHFR.RYLD...QFVPERIRRELNKAICGLRPGVSSSENLSAVA
parg      778 NECLITGTGEQYSEITGYAETIRWA.....RSEEDGSE.RDDCERCTEIVDAIDALEFR.RYLD...QFVPERIRRELNKAICGLRPGVSSSENLSAVA
parg      770 NECLITGTGEQYSEITGYAETIRWA.....RSEEDGSE.RDDWQRCTEIVDAIDALEFR.RYLD...QFVPERIRRELNKAICGLRPGVSSSENLSAVA
parg      408 FEALVHMLGASRISNITGYAGSFENS.....GNFEDSTP.RDSSGRRTAIVDAIDALEFA.QSHE...QYREDLMEELNKAICGLRPGVSSSENLSAVA
eparg     560 LEAISIVGAIYVSSYITGYGETLKWAEIQFNESRQNTNEFRDRFGRRLVETIADAIDALFRGSKLDCQTEQLNKAIIEMREASIGFMSGGQFTNIP.IV

parg      868 TGNWGGCAFPGDARLKALIQILAAAAAERDVIYPTFGDSELMRDIYSMETPLTERKLTVGE.VYKLLRLYYNEECRNCSTPGP.....DIKLYPFIYA
parg      867 TGNWGGCAFPGDARLKALIQILAAAAAERDVIYPTFGDSELMRDIYSMETPLTERKLTVGE.VYKLLRLYYNEECRNCSTPGP.....DIKLYPFIYA
parg      859 TGNWGGCAFPGDARLKALIQILAAAAAERDVIYPTFGDSELMRDIYSMETPLTERKLDVGR.VYKLLRLYYNEECRNCSTPGP.....DIKLYPFIYA
parg      495 TGNWGGCAFPGDSYKALLQILVCAQLGRFLAYTTFGNVEFRDPEEMWLLFRNDGTTVQ.LWS.ILRYSRLIKERSSKEPRENKASKRKLDFI...
eparg     659 TGNWGGCAFNGDKFLKFIQVIAAGVADRFLHFCFSFGFELAAKCKRIIERMKQKDVTLGKSCFSYFS-----

parg      961 VESCTQTTNQPGQRTGA-----
parg      960 VESCAETHDSGQRTGT-----
parg      952 VESSAETDMFGQKAGT-----
parg      590 KEELKKVRDVPGEASABEAGSSRVAGLGEGKSETSAKSSPELNKQPARQITITQOSTDLLPAQLSDQNSNSEDQALLMLSDDDEANAMHEAASLEAKS
eparg     727 -----

parg      978 -----
parg      977 -----
parg      969 -----
parg      690 SVEISN SSTSRSTSSTATRSMSGSGGRQLSLLEMLDTHIEKGSASKRPRKSPNCSKAEGS AKSRREIDVTDKDERDDIVD
eparg     727 -----

```


FIGURE 17

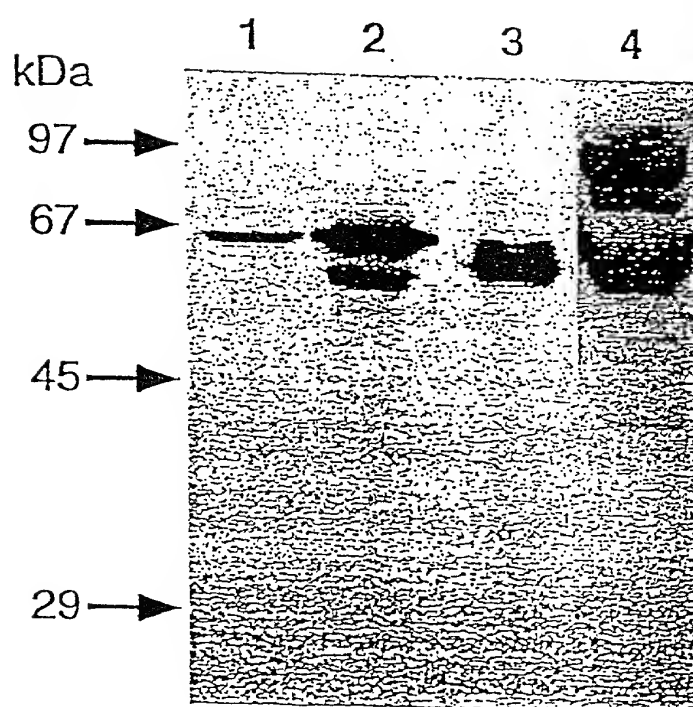




FIGURE 19

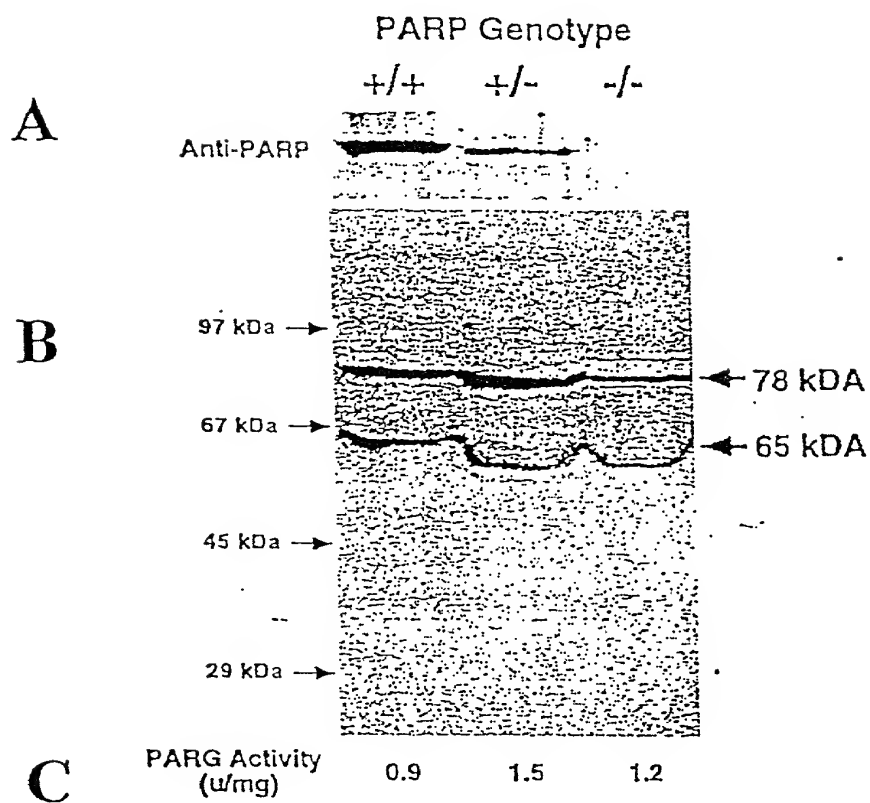


FIGURE 20

Genomic cloning of the PARG gene

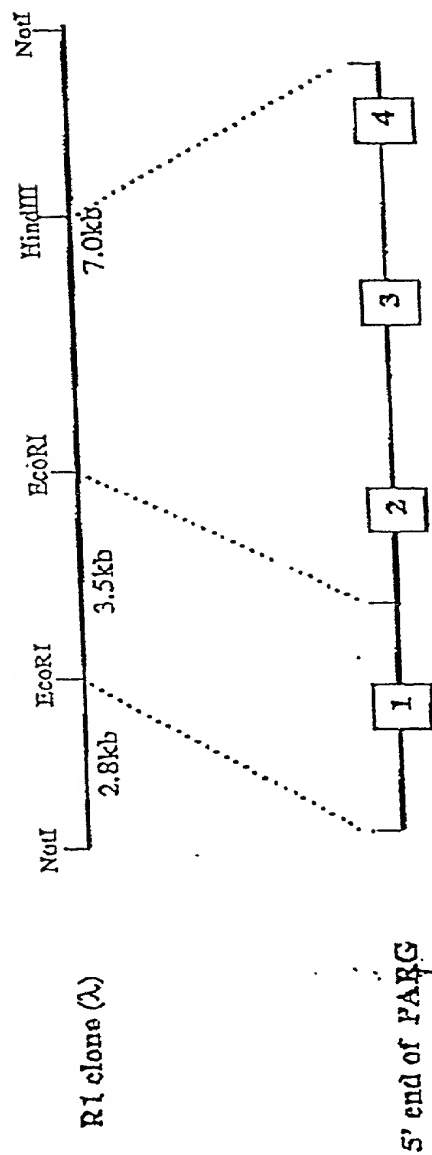


FIGURE 21
T06001" 144E 2650

